

WHAT IS CLAIMED IS:

1. An optical module comprising:

a semiconductor light-emitting device having a light-emitting surface for emitting light; and

5 a semiconductor light-receiving device having a light incident surface for receiving the light emitted from the light-emitting surface of the semiconductor light-emitting device, a light-absorbing layer for absorbing a part of the light incident from the light incident surface, and a light-emitting surface for emitting light transmitted through the light-absorbing layer,

wherein the optical module outputs the light emitted from the light-emitting surface of the semiconductor light-receiving device.

15 2. The optical module according to claim 1, wherein the semiconductor light-emitting device further comprises an active layer,

wherein the active layer and the light-absorbing layer include same III-V compound semiconductor.

20 3. The optical module according to claim 2, wherein the light-absorbing layer of the semiconductor light-receiving device is made of InGaAs.

4. The optical module according to claim 3, wherein the semiconductor light-receiving device further comprises a cap layer made of InP provided on the light-absorbing layer and a substrate made of InP.

5. The optical module according to claim 2, wherein a thickness of the light-absorbing layer is not more than 200 nm.

6. The optical module according to claim 1, further comprising an optical fiber having an end optically coupling to the light-emitting surface of the semiconductor light-receiving device,

wherein the light emitted from the light-emitting surface of the semiconductor light-receiving device is outputted through the optical fiber.

7. The optical module according to claim 6, further comprising:

a lens for condensing the light emitted from the light-emitting surface of the semiconductor light-receiving device to the end of the optical fiber;

a lens holder for holding the lens;

a stub for securing the optical fiber, the stub having an end surface and another surface, the end of the optical fiber being exposed at the end surface of the stub;

a stem for mounting the semiconductor light-emitting device and the lens holder; and

wherein the optical fiber has another end exposing at the another surface of the stub and the light emitted from the light-emitting surface of the semiconductor light-receiving device is outputted from another end of the optical fiber.

8. The optical module according to claim 7, wherein the semiconductor light-emitting device further comprises an active layer,

5 wherein the active layer and the light-absorbing layer include same III-V compound semiconductor.

9. The optical module according to claim 8, wherein the light-absorbing layer of the semiconductor light-receiving device is made of InGaAs.

10 10 The optical module according to claim 9, wherein the semiconductor light-receiving device further comprises a cap layer made of InP provided on the light-absorbing layer and a substrate made of InP.

11. The optical module according to claim 7, wherein a thickness of the light-absorbing layer is not more than
15 200 nm.

12. The optical module according to claim 7, further comprising an optical bench having a first surface and a second surface connected to the first surface, the semiconductor light-emitting device being disposed on the
20 first surface and the light-receiving device being disposed on the second surface; and

a sub-mount for mounting the optical bench.

13. The optical module according to claim 7, further comprising:

25 an optical bench having a first surface a second surface and a third surface connecting the first surface

to the second surface, the semiconductor light-emitting device being disposed on the first surface and the light-receiving surface being disposed on the second surface, the optical bench being mounted on the stem,

5 wherein the light emitted from the light-emitting surface of the semiconductor light-emitting device enters the light incident surface of the semiconductor light-receiving device through the third surface.

14. The optical module according to claim 1,
10 further comprising:

an optical bench including a first region providing the semiconductor light-receiving device and a second region providing the semiconductor light-emitting device; and

15 a package including a base for mounting the optical bench and a first member having an optical window, the optical bench being enclosed in the package,

20 wherein the light emitted from the light-emitting surface of the semiconductor light-emitting device is outputted through the optical window.

15. The optical module according to claim 14, wherein the semiconductor light-emitting device further comprises an active layer,

25 wherein the active layer and the light-absorbing layer include same III-V compound semiconductor.

16. The optical module according to claim 15,

wherein the light-absorbing layer of the semiconductor light-receiving device is made of InGaAs.

17. The optical module according to claim 16, wherein the semiconductor light-receiving device further comprises a cap layer made of InP provided on the light-absorbing layer and a substrate made of InP.

18. The optical module according to claim 14, wherein a thickness of the light-absorbing layer is not more than 200 nm.

19. The optical module according to claim 14, wherein the package further encloses a driver for electrically driving the light-emitting device, and the optical bench further including a third region for providing the driver,

wherein the first region, the second region, and the third region are arranged in this order along a predetermined axis.

20. The optical module according to claim 19, wherein the first member has a plurality of impedance-matched wiring patterns and a plurality of lead terminals,

wherein the driver is electrically connected to the lead terminals through the impedance-matched wiring patterns.